

## CLAIMS

What is claimed is:

1. A beater bar assembly for use within a vacuum cleaner, comprising:
  - a cylindrical beater bar;
  - first and second holding mechanisms for attaching said beater bar to a housing of said vacuum cleaner, wherein said beater bar is rotatable within said holding mechanisms;
  - said first and second holding elements each further comprising bearings, comprising an inner and outer sleeve, wherein each inner sleeve is fixedly attached to said beater bar and each outer sleeve is fixedly attached to said first and second holding elements such that the distal end of the outer sleeve is attached to a medial surface of each holding element; wherein said bearings permit both axial oscillation and axial rotation of the inner sleeves within the fixed outer sleeves.
2. The assembly of claim 1, wherein said bearings further comprise a nylon intermediate ring.
3. The assembly of claim 1, wherein said bearings further comprise roller bearings.
4. The assembly of claim 1, wherein said bearings further comprise deep groove ball bearing/linear ball bearing combinations.
5. The assembly of claim 1, wherein said bearings further comprise alignment

needle roller bearings with an extended inner ring.

6. The assembly of claim 1, wherein said bearings further comprise combinations of needle roller and spherical plain bearings.

7. The assembly of claim 1, wherein said bearings further comprise multi-row ball bearings.

8. The assembly of claim 1, wherein said bearings further comprise single row ball bearings with suitably modified cage guidance.

9. The assembly of claim 1, wherein said beater bar further comprises an annular recess adapted to engage a drive belt in order to enable rotation of said beater bar.

10. The assembly of claim 1, wherein said beater bar further comprises a driving pulley mounted at the end or spaced from the end of said beater bar and adapted to engage a drive belt in order to enable rotation of said beater bar.

11. The assembly of claim 1, wherein said beater bar further comprises a cam protruding from a planar surface of said beater bar and proximal to said first holding element.

12. The assembly of claim 11, wherein said beater bar further comprises a

projection adjacent to said outer sleeve of said bearing, for engagement and disengagement with said cam.

13. The assembly of claim 12, wherein a spring is located around said inner sleeve between said second holding element and said beater bar, so that a cyclical engagement and disengagement of said cam and rounded projection caused by continued rotation of said beater bar generates axial oscillation of said beater bar.

14. The assembly of claim 13, wherein said beater bar is provided with helical brush strips and rigid projections.

15. The assembly of claim 1, wherein said beater bar is provided with helical brush strips and rigid projections.

16. The assembly of claim 1, wherein a planar surface of said beater bar is formed to have a bevel which is not perpendicular to the axis of said beater bar.

17. The assembly of claim 12, wherein said projection is replaced by a recess such that said cam sinks into and emerges from that recess upon rotation of the beater bar.

18. The assembly of claim 12, wherein said projection is movable or removable such that a user may optionally prevent axial oscillation (horizontal motion) of the

beater bar by removing the possibility of engagement of said projection and said cam through a disengagement mechanism.

19. The assembly of claim 18, wherein said disengagement mechanism is a locking pin.
20. The assembly of claim 18, wherein said disengagement mechanism is a solenoid.
21. The assembly of claim 18, wherein said disengagement mechanism is a spring-activated switch.
22. The assembly of claim 13, wherein said spring is a coiled compression spring.
23. The assembly of claim 13, wherein said spring is a leaf spring.
24. The assembly of claim 1, wherein said beater bar is rotated by motor attached to said beater bar via a flat belt.
25. The assembly of claim 1, wherein said beater bar is rotated by motor attached to said beater bar via a rounded belt.